

## CLAIMS

1. A radiation detector comprising  
a main body, and  
a radiation detection probe detachably attached  
5 to the main body,

the radiation detection probe having a detection  
unit including a radiation detection element, and a  
first terminal electrically connected to the radiation  
detection element,

10 the main body having a connector to which the  
proximal end of the radiation detection probe is  
detachably mounted, the connector including a second  
terminal which is detachably connected to the first  
terminal when the radiation detection probe is mounted  
15 to the connector, and

a collimator for collimating radiation being  
provided in the distal end portion of the radiation  
detection probe.

2. The radiation detector according to Claim 1,  
20 wherein

the detection unit has an input face which  
transmits the radiation,

the radiation detection element is arranged so as  
to receive the radiation which has passed through the  
input face, and  
25

the collimator is an opening which faces the

input face.

3. The radiation detector according to Claim 1 or 2, wherein

the radiation detection probe further has a cap-shaped shield member which is mounted to the detection unit so as to cover the radiation detection element,

the shield member is made of a material which blocks the radiation,

the shield member has a front wall facing the radiation detection element, and a cylindrical side wall which extends from the edge of the front wall, and

the collimator is a through-hole provided in the front wall.

4. The radiation detector according to Claim 3, wherein the radiation detection probe further comprises:

a cap-shaped probe cover which covers the shield member and the detection unit, the probe cover being detachably mounted to the connector; and

a seal ring sandwiched between the probe cover and the connector to seal the main body and the radiation detection probe when the probe cover is mounted to the connector.

5. The radiation detector according to Claim 4, wherein

the shield member is disposed in the probe cover

to allow a hollow portion of the shield member and a hollow portion of the probe cover to communicate with each other, and

the detection unit is fitted into these hollow portions which communicate with each other.

6. The radiation detector according to Claim 5, wherein the shield member is detachably provided in the probe cover.

7. The radiation detector according to Claim 5, wherein the shield member is fixed in the probe cover.

8. The radiation detector according to any one of Claims 4 to 7, wherein

the probe cover has a cap-shaped first component detachably mounted to the connector, a cap-shaped second component detachably attached to the first component to accommodate and fix the shield member, and a seal ring sandwiched between the outer surface of the first component and the inner surface of the second component to seal the probe cover when the second component is attached to the first component, and

the second component is attached at positions variable along the axis of the probe cover.

9. The radiation detector according to any one of Claims 4 to 8, wherein

the probe cover has an input plate facing the front wall of the shield member to close an end of the

collimator, and a cylindrical side wall extending from the edge of the input plate to surround the side surfaces of the shield member and the detection unit, and

5           the input plate is made of a material which transmits the radiation and blocks an electromagnetic wave having an energy of 1 keV or less.

10.   The radiation detector according to any one of Claims 4 to 9, wherein

10           the detection unit has a casing for accommodating the radiation detection element,

          an opening is provided on the distal end of the casing so as to extend from an end face of the casing toward the radiation detection element, and

15           the opening has substantially the same cross-section as that of the collimator and communicates with the collimator.

20           11.   The radiation detector according to Claim 1 or 2, wherein the radiation detection probe further includes:

          a cap-shaped probe cover which covers the detection unit, the probe cover being detachably mounted to the connector; and

25           a seal ring sandwiched between the probe cover and the connector to seal the main body and the radiation detection probe when the probe cover is

mounted to the connector,

the probe cover is made of a material which blocks the radiation, and

5 the collimator is an opening provided on the distal end of the probe cover to extend toward the radiation detection element.

12. The radiation detector according to Claim 11, wherein

10 an input plate for closing an end of the collimator is provided on the distal end surface of the probe cover, and

the input plate is made of a material which transmits the radiation and blocks an electromagnetic wave having an energy of 1 keV or less.

15 13. The radiation detector according to any one of Claims 1 to 4, wherein

the connector further includes a support bar protruding from the distal end of the main body and being thinner than the radiation detection probe, and

20 the support bar has a proximal end connected to the distal end of the main body and a distal end connected to the radiation detection probe.

14. The radiation detector according to Claim 13, wherein

25 the connector further includes a slide member slidably attached to the support bar, and

the collimator moves along with the slide member, and the distance between the collimator and the radiation detection element varies when the slide member slides relative to the support bar.

5           15. The radiation detector according to any one of Claims 1 to 14, wherein

one of the first and second terminals is a pin, and the other is a socket into which the pin is fitted.

10           16. The radiation detector according to Claim 15, wherein

the pin includes a plurality of pins having different fitting lengths and different polarities, and

15           the socket includes a plurality of sockets having fitting lengths and polarities corresponding to the plurality of pins.

17. A radiation detector comprising

a main body, and

a radiation detection probe detachably attached to the main body,

20           the radiation detection probe having a radiation detection element, and a first terminal electrically connected to the radiation detection element, a cylindrical element cover surrounding the radiation detection element, and a cylindrical casing for  
25           accommodating the element cover,

the main body having a connector to which the

proximal end of the radiation detection probe is detachably mounted, the connector including a second terminal which is detachably connected to the first terminal when the radiation detection probe is mounted to the connector,

the element cover being made of a material which blocks radiation, and

the radiation detection element being disposed behind the distal end of the element cover.

18. The radiation detector according to Claim 17, further comprising a fastener detachably mounted to the main body to fasten the radiation detection probe to the connector.

19. The radiation detector according to Claim 18, further comprising a seal ring sandwiched between the fastener and the connector to seal the main body when the fastener is mounted to the connector.

20. The radiation detector according to any one of Claims 17 to 19, wherein

an input plate facing the radiation detection element is provided on the distal end surface of the casing, and

the input plate is made of a material which transmits the radiation and blocks an electromagnetic wave having an energy of 1 keV or less.